

Title (en)
COVER

Title (de)
ABDECKUNG

Title (fr)
COUVERCLE

Publication
EP 3791440 B1 20240306 (EN)

Application
EP 19729568 A 20190614

Priority
• EP 18183790 A 20180716
• EP 2019065687 W 20190614

Abstract (en)
[origin: WO2020015938A1] A passive radio repeater is built into a cover for a pit, in order to relay radio signals between a base station and a wireless communications device such as a water meter at the bottom of the pit. Within the external surface (41, 48) of the lid are provided upper and lower patch antennas (42, 47). The lower antenna (47) has a radiation pattern that extends downwards at right-angles to the plane of the lid, so that it communicates with the device at the bottom of the pit. The top antenna (42) has a directional beam pattern in the elevation plane, achieved achieved by exciting the top antenna in a mode that is higher than fundamental. The two antennas are coupled by a stripline printed circuit board (45) provided with feeds (92, 98) to generate the required beam patterns.

IPC 8 full level
H01Q 1/22 (2006.01); **H01Q 9/04** (2006.01); **H01Q 25/00** (2006.01)

CPC (source: EP US)
E02D 29/14 (2013.01 - US); **H01Q 1/2233** (2013.01 - EP); **H01Q 1/48** (2013.01 - US); **H01Q 9/0407** (2013.01 - EP); **H01Q 9/045** (2013.01 - US); **H01Q 21/0075** (2013.01 - US); **H01Q 25/005** (2013.01 - EP); **H04B 7/145** (2013.01 - US)

Citation (examination)
• US 5583492 A 19961210 - NAKANISHI YUTAKA [JP], et al
• GB 2486675 A 20120627 - DUBLIN INST OF TECHNOLOGY [IE]
• US 5659300 A 19970819 - DRESSELHUYS DONN R [US], et al
• WO 2012113397 A1 20120830 - MIITORS APS [DK], et al

Designated contracting state (EPC)
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)
WO 2020015938 A1 20200123; CN 112424997 A 20210226; CN 112424997 B 20240326; EP 3791440 A1 20210317; EP 3791440 B1 20240306; US 11271324 B2 20220308; US 2021249785 A1 20210812

DOCDB simple family (application)
EP 2019065687 W 20190614; CN 201980047165 A 20190614; EP 19729568 A 20190614; US 201917250381 A 20190614